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ABSTRACT

In presenting and discussing a formula for determining the cost-effectiveness of health promotion programs, this paper addresses the following economic concepts: (1) cause-specific years of life gained; (2) increased earnings; (3) program participant absenteeism, turn-over, and sick day utilization savings; (4) program cost; (5) cost per participant; and (6) benefit ratio of a prevention program. An example illustrating use of the formula is offered. (JD)

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Measuring the Economic Impact of Health Promotion Programs

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MEASURING THE ECONOMIC IMPACT OF HEALTH PROMOTION PROGRAMS

Introduction

Some health promotion specialist are attempting to translate clients positive health behavior changes into economic indicators reflective of intervention program success (i.e. economic benefits). Positive health behavior changes attained have been given a dollar value by some authors. However this approach has not been unequivocally legitimatized in the literature. This paper will address the following concepts:

I. Selected Economic Indicator Formulae
   - A. Cause Specific Years of Life Gained
   - B. Increased Earnings
   - C. Program Participant Absenteeism, Turn-Over and Sick Day Utilization Savings

II. Selected Program Cost Effectiveness Indicators
   - A. Program Cost
   - B. Cost Per Participant
   - C. Benefit Ratio of a Prevention Program

Most of the data necessary for calculating positive behavior changes can be made available by the sponsoring company or organization (e.g. employee absenteeism and turn-over rates or insurance costs, etc.). If a company is unable to provide the needed information, two options exist. First, is the use of standard values for the industry and second, the development of an instrument for the collection of self report program participant data. Also some companies are unwilling to share employee specific data but will share anomyous data such as smokers vs nonsmokers, the obese vs non-obese, or program participants vs non-participants. Table 1 indicates some sample data and sources.

Table 1
Selected Economic Indicator Data Sources

Data	Source
Life Expectancy, 1980 Male = 70 years Female = 77.5 years	Florida Vital Statistics
Average Household Income Florida = $13,500.00 per year	US Census Bureau, Survey of Housing, 1980

Formal Economic Indicators

Selected economic indicator formulas utilize a human capital approach, where as a dollar value is placed upon work and productivity. Generally, under valued are the young, retired, and housewives. Also, the value of pain, suffering, and the life may not be included. Finally, the selected economic indicator formulae should be used only with work site health promotion programs, since some needed values are missing in the formula. However, the program cost effectiveness indicator formulae may be used for any health promotion program regardless of site since it does consider the missing values. The formulae is as follows:

A. Cause Specific Years of Life Gained

1. Formula: Life expectancy - x age of death x for population

2. Application

a. Calculate years of life lost
70 (life expectancy for males)
- 60 (x age of death for male smokers)
10 years of life lost per individual

b. Calculate years of life gained
80 former smokers X 10 = 800 years of life gained because 80 persons quit smoking thus adding 10 years to their respective productive work life

c. By calculating only years of life lost, resulting is the number years a behavioral health habit can cost a population in productivity. These data may be used for project marketing.

B. Increased Earnings

1. Formula: Years of life gained X Average Income for Florida - 10% discount for inflation.
2. Application
   a. 800 (years of life gained) X $13,500.00 (annual income for this state) - 10% = $9,360,000.00 in increased earnings.

   b. By helping 80 persons to quit smoking, the intervention program gained $9,360,000 by adding 10 years of productive work life to each employee. Retirement in now possible at age 70 in Florida.

3. By only calculating years of life lost and then adding a dollar value to it, determined is the dollar amount a behavioral health habit can cost a population (eg. a union) in lost earnings. By changing the name of the formula (eg.) from Increased Earnings to Lost Earnings, resulting is a different concept which can be used for marketing a program.

C. Program Participant Absenteeism, Turn-Over and Sick Day Utilization Savings

1. Formula: Days Reduced X Daily Average Wage
   This formula can be used to calculate 3 separate measures of economic impact.

2. Application

   a. Calculate Days Reduced

220	Pre Program _____	days Utilized
- 110	Post Program _____	days Utilized
110	Reduction in ____	days Utilized

   b. Calculate Economic Savings
   110 (days saved by participants) X $75.00 (daily average for Company Q) = $8,250.00. This was saved for Company Q by the intervention program service fewer work days were missed by program participants.

3. If the name of the formula were changed to Program Participant Absenteeism, Turn-Over, and Sick Day Utilization Costs Due to Behavior or Disease Y, then the formula could be used for marketing purposes.

Comparisons between experimental and control groups will accentuate program economic accomplishments.

Selected Program Cost Effectiveness Indicators

The cost effectiveness approach compares the costs of different programs designed to achieve a given end (eg. postponing death from a specific cause by one year). Identified may be the lowest cost alternative for a procedure or program, which may have little or no benefit while using the human capital approach. The formulae is as follows:

A. Program Cost

1. Formula: #participants X charge per participant = program cost
2. Application: Cost of Smoking Cessation Course
   75 smokers X $150.00 = $11,250.00 cost
3. If the program resulted in 75 persons quitting smoking, and another program achieved the same results at a cost of $20,000.00, then your program was more cost effective. This formula can be used for either evaluation or marketing purposes.

B. Cost per Participant

1. Formula: $\frac{\text{program cost}}{\text{\# participants}}$
2. Application: Cost of Smoking Cessation Course
   $\frac{11,250.00}{75}$ = $150.00 cost
3. With a small modification, this formula can be used in a similar manner. Suppose a smoking cessation program cost Company Q $8,200.00, irrespective of the number enrolled and a competitor at Company Z charged $8,200.00 irrespective of the number enrolled. Your program helped 97 people quit and he assisted 57 individuals. Using the above formula, your program cost $84.54 per quitter and his cost $143.86 per quitter. Your program was not only more effective in changing behavior, but also, is more inexpensive in terms of intended results.

C. Benefit Ratio of a Program

1. Formula: $\frac{\text{Projected Savings}}{\text{Expenditures}}$
2. Application: Savings from a Smoking Cessation Course
   $\frac{\$100,000.00}{\$25,000}$ = 4:1 Benefit Ratio

3. Projected savings may be calculated by summing the economic indicator data from the previous section. In the case of this program, $4.00 was saved for every dollar spent.

While there are more complicated formulae that may be used to calculate cost effectiveness, these particular formulae were selected since the data are fairly accessible. When knowledge, attitudes, behavior changes, and economic impact are measured, resulting is the impact effectiveness and worth of the intervention program.

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